PREVIOUS USUTU VIRUS EXPOSURE PARTIALLY PROTECTS MAGPIES (PICA PICA) AGAINST WEST NILE VIRUS

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Abstract

Currently at least five different flaviviruses are known to co-circulate in Spain and potentially other regions of Europe, namely West Nile virus (WNV) of lineage one and two, Usutu virus (USUV), Bagaza virus (BAGV) and Meaban virus. West Nile virus is a significant cause of mortality for many wild bird species in the North American continent, while in Europe wild bird deaths are usually sporadic, except for mass mortalities of Eurasian magpies due to WNV lineage 2 recorded in Greece in 2017/18. In contrast, Usutu virus a closely related flavivirus causes epizootics in wild and captive birds in Europe, but usually not in Eurasian magpies (Pica pica). The infection cycle of USUV in avian hosts and how sequential exposure of birds to co-cycling Flaviviruses affect infection outcome is virtually unknown. Our objective was to experimentally determine the susceptibility of Eurasian magpies to USUV, and explore how previous exposure to USUV would affect infection with lineage 1 WNV. None of the magpies succumbed to USUV infection. However, after challenge with a neurovirulent WNV strain 75% (6/8) of the magpies survived, while only 22.2% (2/9) of those not previously infected with USUV did. Viremia and viral titer of WNV in feather pulps of previously USUV infected magpies was lower, while neutralizing antibody titers did not differ significantly. Our data indicate that infection with USUV is not lethal for magpies, but partially protects them against a lethal challenge with WNV, although the mechanism is unclear. These results can be relevant for flavivirus ecology and contention.